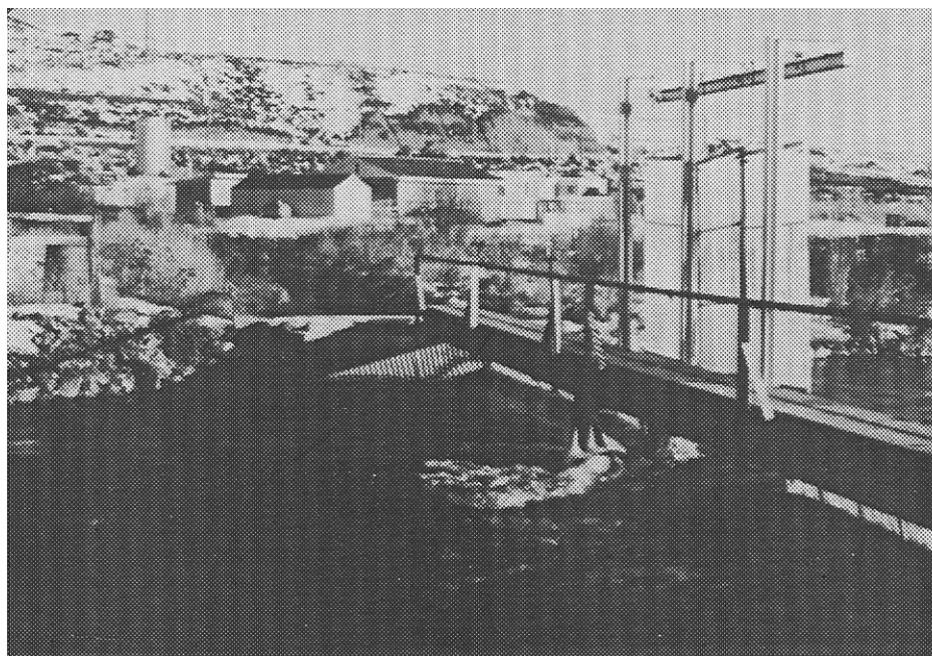




# **PAHSIMEROI HATCHERY**

**1992 Brood Year Report  
Summer Chinook**



by

**Bob Moore, Fish Hatchery Superintendent II  
Doug Engemann, Fish Hatchery Superintendent I**

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## TABLE OF CONTENTS

	<u>Page</u>
ABSTRACT .....	1
INTRODUCTION .....	2
OBJECTIVES .....	2
HATCHERY FACILITIES .....	2
WATER SUPPLY .....	2
SUMMER CHINOOK TRAPPING .....	2
HOLDING POND RECORD .....	3
SUMMER CHINOOK RELEASE .....	3
SUMMER CHINOOK SPAWNING INFORMATION .....	4
SPAWNING TECHNIQUES .....	4
ADULT SPawner DISEASE SAMPLING .....	4
CARCASS DISPOSITION .....	4
FISH PRODUCTION .....	4
FISH RELEASES .....	5
FISH HEALTH .....	5
Diseases Encountered and Treatment .....	5
Acute Losses .....	5
Other Assessments .....	5
FISH MARKING .....	6
HATCHERY IMPROVEMENTS .....	6
STAFFING .....	6
ACKNOWLEDGEMENTS .....	7
APPENDICES .....	8

## LIST OF APPENDICES

Appendix 1.	Brood year 1992 chinook salmon run timing .....	9
Appendix 2.	Length frequency of total chinook trapped, 1992 .....	10
Appendix 3.	Length frequency of male chinook, total trapped, 1992 .....	11

## LIST OF APPENDICES

	<u>Page</u>
Appendix 4. Length frequency of female chinook, total trapped, 1992 .....	12
Appendix 5. Length frequency of ponded male summer chinook, 1992 .....	13
Appendix 6. Length frequency of ponded female summer chinook, 1992 .....	14
Appendix 7. Length frequency of released male summer chinook, 1992 .....	15
Appendix 8. Length frequency of released female summer chinook, 1992 .....	16
Appendix 9. Pahsimeroi Hatchery run timing for brood year, 1992 .....	17
Appendix 10. Pathology fish health report .....	19
Appendix 11. Pahsimeroi Hatchery summer chinook and spring chinook releases and returns .....	22
Appendix 12. Pahsimeroi Hatchery spring chinook releases and returns .....	23
Appendix 13. Summer chinook smolt release and adult returns .....	24
Appendix 14. Brood Year 1992 summer chinook production costs .....	25

## **ABSTRACT**

The trap was set up on June 1 and was pulled on September 29, 1992. The first fish was trapped June 12, 1992 and the last fish arrived on September 19, 1992. A total of 131 summer chinook were trapped during 1992. The run was comprised of 72 adult males, 5 jacks, 53 adult females, and 1 3-year-old female.

One-third of the run was released above the weir to spawn naturally. This amounted to 23 males, 18 females, and 2 jacks.

A total of 35 adult females were spawned with 36 males (including 2 jacks) for 172,139 green eggs. Fecundity averaged 4,918 eggs per female, and an eye-up of 97.63% was achieved resulting in 168,065 eyed eggs.

A total of 130,510 summer chinook smolts weighing 9,685 lbs, at an average 13 fish per pound, were released in April of 1994. These fish were reared with an overall conversion of 1.63.

Author:

Douglas Engemann  
Fish Hatchery Superintendent I

## **INTRODUCTION**

Pahsimeroi Hatchery is owned and funded by Idaho Power Company (IPC) and is operated by the Idaho Department of Fish and Game (IDFG). The salmon and steelhead programs are mitigation for the loss of anadromous fish and anadromous fish habitat due to the dams constructed on the Snake River in Hells Canyon. The hatchery is located near Ellis, Idaho, one mile upstream on the Pahsimeroi River, with the chinook rearing ponds located at a separate facility seven miles upstream on the Pahsimeroi River.

## **OBJECTIVES**

The objectives of the Pahsimeroi Hatchery are as follows:

1. To rear one million summer chinook smolts for release into the Pahsimeroi River.
2. To trap and spawn summer chinook adults returning to the Pahsimeroi River.

## **HATCHERY FACILITIES**

Located on the hatchery is a fish trap constructed of three concrete pens measuring 15 ft x 75 ft x 4.5 ft deep. Adult fish are held in these pens until they are spawned. The trap has a series of ladders in the structure and a metal grate that keeps the fish from returning to the river. A 55-ft-long weir crosses the Pahsimeroi River to guide the arriving fish into the trap facility.

Near the trap facility lie two residences, two pump houses, a 10,000-gallon water storage tank, a metal shop building, a cinder block office building, a public restroom, an incubator room with capacity for 20 double stacks of Heath incubators, and a building with a two-bedroom dormitory and workshop. Four concrete raceways (4 ft x 100 ft) are used for early rearing of salmon and steelhead fry.

Two dirt rearing ponds (40 ft x 300 ft) are located seven miles above the trap at a separate facility. These are used to rear chinook smolts. Facilities at the upper site include a residence, a small storage building, a feed bin for storing dry bulk feed, and a walk-in freezer for storing frozen salmon feed.

## **WATER SUPPLY**

Water for the hatchery is supplied by the Pahsimeroi River and varies in temperature from 32°F during the winter to 67°F in summer.

The river water has a high organic load during winter, but clears during the summer months. In addition, the hatchery has spring water available for its egg incubation system. Spring water temperature varies from 52°F in the winter to 55°F in the summer, and has a pH of 7.8.

## **SUMMER CHINOOK TRAPPING**

Trapping for summer chinook started on June 1 and ended on September 24 (Appendices 1 and 6). The run consisted of 126 adults and 5 jacks for a total

of 131 fish, including 72 adult males and 53 adult females. Fork lengths were taken on all fish entering the trap (Appendix 2). The age class breakdown was done by length this year. All males 60 cm and under were classified as jacks. Male and female fish 61 cm through 82 cm were classified as 4-year-olds, and all fish 83 cm and over were classified as 5-year-olds (Appendices 3, 4, and 5).

Pre-spawning mortality amounted to 3 males and 1 female, or 3 percent. Kidney samples taken were tested by the ELISA method and showed one male as high BKD (single injection as compared to double injected adults) and one male as low BKD (non-injected). The third fish indicated no BKD (non-injected), however signs of other infections were evident. One female was found dead in the trap prior to sorting. She was in poor condition, and scarring and fungus were evident.

Fish entering the trap in June were marked with a single opercle punch. Those entering in July and August were not marked, and those entering in September received a double opercle punch. During spawning, the fish were paired according to their arrival in the trap. This was done to maintain the September component of the run.

Of the 77 males and 54 females trapped, their disposition is as follows:

<b>FEMALES</b>	<b>MALES</b>
18 released	23 adults released
35 spawned	2 jacks released
1 trapping mortality	49 adults held:
	46 spawned
	3 pre-spawn mortality
	3 jacks held:
	2 spawned
	1 escape

#### **HOLDING POND RECORD**

Erythromycin phosphate injections were used this year to help prevent BKD mortalities. Of the ponded fish, 40 were injected at 10 mg/kg, 19 were injected at the double dose rate of 20 mg/kg, and 28 fish received no injection. Kidney samples were taken on all spawned fish and were analyzed for BKD as part of the Investigational New Animal Drug (INAD) testing requirements.

Additionally, the females were treated 3 times a week for one hour with 166.7 ppm formalin to prevent fungus.

A black plastic shade was used to cover the water surface of the female holding pen to reduce the stress from the public. The yard lights were turned off during the summer to induce the fish to ripen naturally. The fish were left undisturbed until late August when sorting for ripe fish began.

#### **SUMMER CHINOOK RELEASE**

One-third of the run was released above the weir to spawn naturally in the Pahsimeroi River. These fish were released throughout the run as they entered the trap. The released fish amounted to 23 males, 18 females, and 2 jacks.

## **SUMMER CHINOOK SPAWNING INFORMATION**

Summer chinook spawning began on August 27 and concluded on September 21. A total of 35 females were spawned for 172,139 green eggs. Fecundity averaged 4,918 eggs per female, and the average eye-up was 97.63% for 168,065 eyed eggs. The average egg size was 12.85 ml displaced per 50 eggs.

## **SPAWNING TECHNIQUES**

Females were sorted twice a week for ripeness. Ripe fish were killed by a blow to the head and bled by severing the caudal artery. Salmon were spawned at a ratio of one female to one male, and 5.5% of the males used were jacks. To ensure fertility toward the end of the run, two males were spawned with each female. Females were incised and eggs deposited into a colander to drain ovarian fluid. Eggs were then placed into a bucket and fertilized. Well water was added to activate the sperm and eggs, stirred by hand, and allowed to sit for five minutes. The eggs were then loaded into the incubator trays at the rate of one female per tray. Each of these trays, containing a 200 ppm iodine solution (Argentyne) was allowed to sit for 60 minutes before being put back into the water flow of the incubator stack.

After 48 hours, daily treatments of 1,667 ppm formalin were used to reduce fungus growth before eye-up. The first lot of eggs eyed up September 17 and the final lot on October 12. After shocking, the eggs were hand-picked, measured, enumerated by displacement, and run through an electronic counter to compare methods. The eggs were loaded back into the incubators at a density of 1,000 ml per tray for hatching. The dead egg numbers were subtracted from the eyed egg numbers to get the percent eye-up.

## **ADULT SPAWNER DISEASE SAMPLING**

Disease samples were taken from each fish. Eggs from each female were put into separate trays. Only one female showed high positive results for BKD, and her progeny were reared separately.

## **CARCASS DISPOSITION**

Of the 88 fish ponded, 59 were injected with erythromycin, and all fish were treated externally with formalin. Since the fish were treated, the carcasses were hauled to the landfill and buried.

## **FISH PRODUCTION**

Transfer of salmon fry into the raceways began during mid-December and continued through February. Initially, these fish were fed BioDiet starter and grower at a rate of 3% of body weight. During late March and early April, all fish were fed a 4.5% gallimycin feed mixture as a prophylactic treatment for BKD. The treatment rate was 10 mg/kg fish daily for a 21-day period.

The fish were ponded during late May and early June this year after being marked with an adipose fin clip or left ventral clip. Pond 1 received 63,703 fish, and pond 2 received 63,810 fish. Raceway 1 retained 3,806 fish. These

were the progeny of a high BKD female and were segregated for the remainder of the rearing cycle.

All fish were fed BioProducts BioMoist feed pellets after ponding, with another 21-day gallimycin treatment starting in early October. Total feed fed was 17,229 for a total conversion of 1.63.

### **FISH RELEASES**

The 130,510 smolts were released during the week of April 8-12, 1994. Fish totalling 63,294 were released from pond 1 amounting to 4,653 pounds at 13.6 fish/lb, with a conversion of 1.57.

From pond 2, 63,496 fish were released for a total of 4,884 pounds at 13.0 fish/lb, with a conversion of 1.62 for the rearing cycle.

From raceway 1, 3,720 fish were released for a total of 248 pounds at 15.0 fish/lb, with a conversion of 2.75.

The screens and one set of boards were pulled daily until the ponds were emptied. Very few fish had to be forced out of the ponds this year due to the relatively late release of these fish.

### **FISH HEALTH**

#### **Diseases Encountered and Treatment**

No losses due to diseases were encountered in the final rearing ponds. Whirling disease was found and a moderate optical density was found in one pool of the high BKD raceway. No treatments except the prophylactic erythromycin treatments of a chemotherapeutic nature were applied to these fish.

#### **Acute Losses**

Acute losses were not experienced at Pahsimeroi Hatchery. Chronic losses were experienced, as usual, in the cement raceways (lower facility) in the spring due to environmental gill disease. No treatment was administered to the fish at that time due to the fact that Food and Drug Administration (FDA) approved chemotherapeutants were not available. Whirling disease agent Myxobolus cerebralis was found through most of the rearing cycle. Both intensity and number of positive pools were increased from the previous year. Although there was an increase in the observation of this parasite at this site, aberrant behavior associated with this agent was almost absent. A few black tails (less than 300), a sign of whirling disease, were observed by the hatchery personnel.

#### **Other Assessments**

Differences in organosomatic index parameters are partially due (or entirely) to a difference in sampling dates (Appendix 7). Release dates were significantly later than in previous years, thus analysis was later in the year. The fish sampled were obviously smolting, and it is logical that morphological changes can be associated to physiological changes.



A method of management must be established to circumvent the adverse effects of Myxobolus cerebralis. It has been established that once the ossification process is well under way, infection by this particular protozoan is less pathogenic. This usually occurs at 7 cm in length. The longer these fish can be reared on specific pathogen-free water, the healthier (less parasitized) these animals will be.

#### **FISH MARKING**

All the fish were marked with either an adipose fin clip or a left ventral clip prior to ponding. The numbers and marks are as follows:

POND #	NUMBER AD-CLIPPED	NUMBER LV-CLIPPED
1	40,903	22,800
2	41,002	22,800
R1	2,651	1,155

Additionally, 500 fish from each pond were PIT-tagged in September. None of the fish were coded-wire tagged (CWT) this year.

#### **HATCHERY IMPROVEMENTS**

Idaho Power personnel constructed a chemical storage building, as well as a heated spawning house and ripe fish holding pens in front of the spawning house. For added safety, IPC also installed walkways over the raceway walls. Baffles were constructed by hatchery personnel and installed in the concrete raceways. A new residence was constructed at the lower facility replacing the residence at the upper facility.

#### **STAFFING**

The hatchery is staffed with two permanent employees; a Hatchery Superintendent II, and a Hatchery Superintendent I. Several temporaries are employed at various times of the year to help with the spawning of steelhead and salmon.

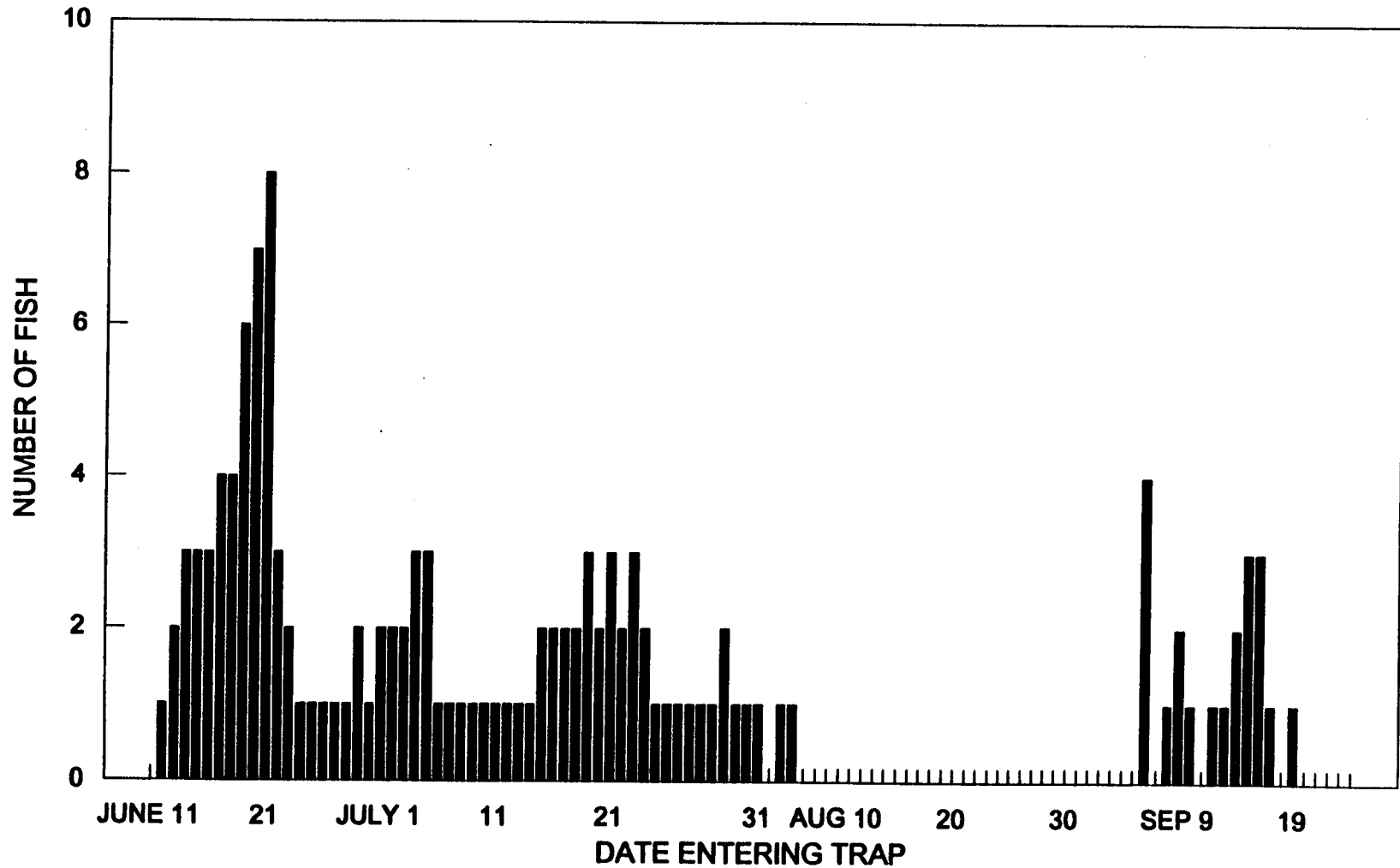
## ACKNOWLEDGEMENTS

The crew at Pahsimeroi Hatchery would like to express their appreciation to all those who helped with the spawning and transporting of steelhead and salmon. We would also like to thank Paul Abbott and the staff of Idaho Power Company for their continued help and support.

## A P P E N D I C E S

# PAHSIMEROI SUMMER CHINOOK SALMON RUN

## BROOD YEAR 1992

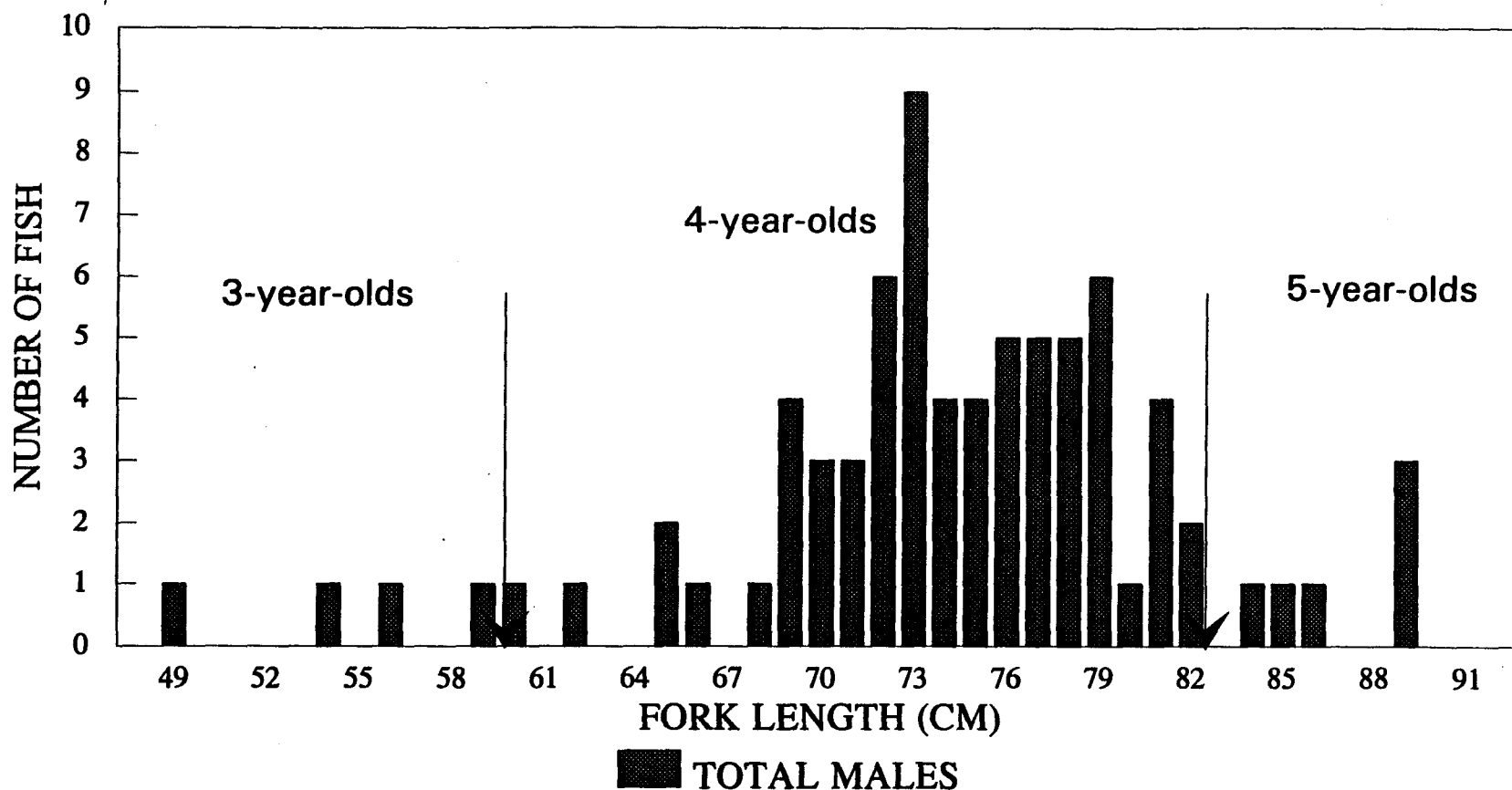


Appendix 2. Length frequency of total chinook trapped, 1992.

Males				Females			
(cm)	Total trap	Pond	Release	(cm)	Total trap	Pond	Release
49	1	1		49			
50				50			
51				51			
52				52			
53				53			
54	1	1		54	1	1	
55				55			
56	1		1	56			
57				57			
58				58			
59	1		1	59			
60	1	1		60			
61				61			
62	1	1		62			
63				63			
64				64			
65	2	1	1	65			
66	1	1		66	1	1	
67				67			
68	1	1		68	2	2	
69	4	2	2	69	2	2	
70	3	1	2	70	3	2	1
71	3	3		71	2	2	
72	6	4	2	72			
73	9	6	3	73	1		1
74	4	3	1	74	1		1
75	4	2	2	75	1	1	
76	5	1	4	76	1	1	
77	5	4	1	77	1	1	
78	5	4	1	78	5	2	3
79	6	6		79	3	1	2
80	1		1	80	5	4	1
81	4	3	1	81			
82	2	1	1	82	4	1	3
83				83	2		2
84	1	1		84	4	3	1
85	1	1		85	3	2	1
86	1	1		86	1	1	
87				87	4	4	
88				88	4	3	1
89	3	2	1	89	1	1	
90				90	2	1	1
91				91			
92				92			
93				93			
	77	52	25		54	36	18

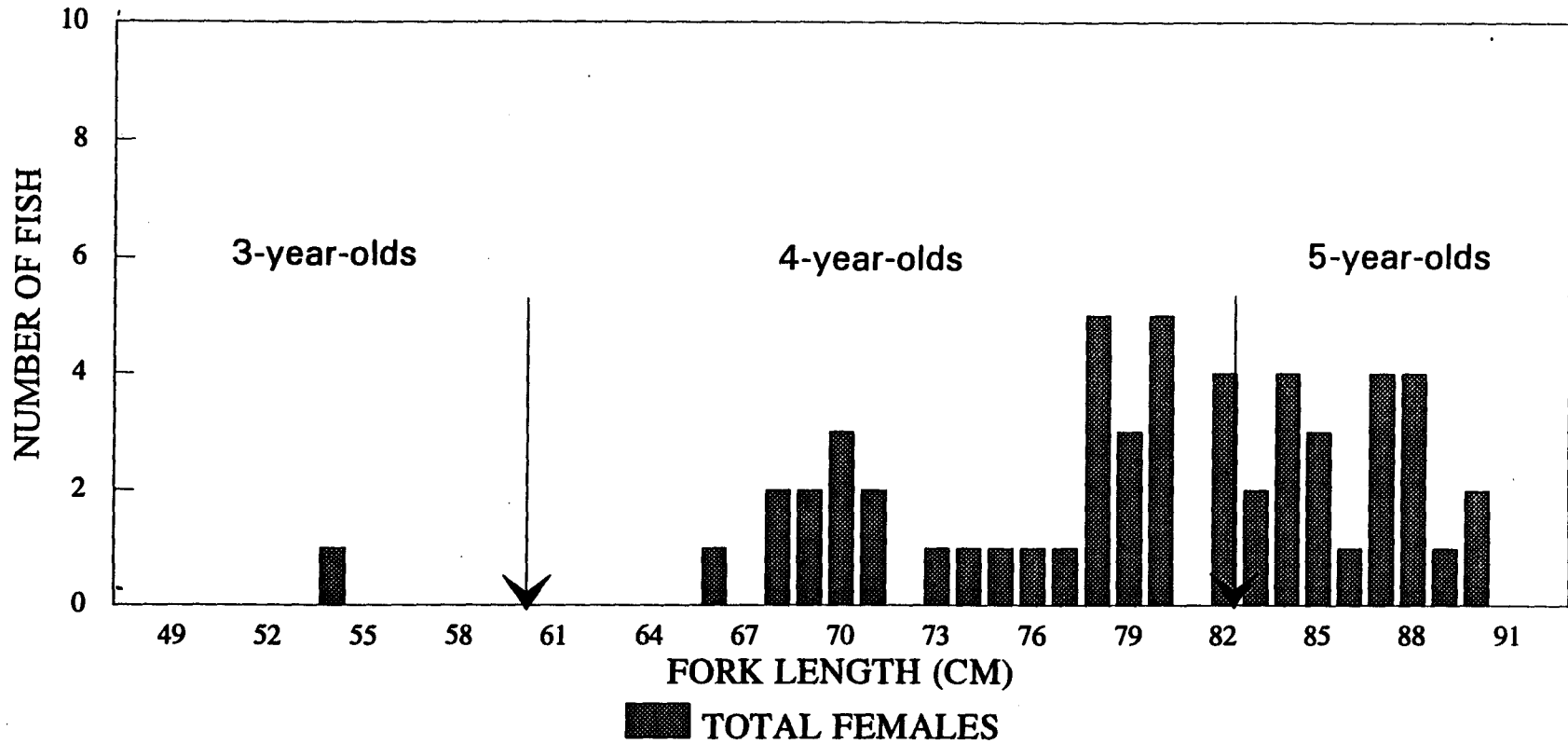
# LENGTH FREQUENCY SUMMER MALES-1992

PAHSIMEROI HATCHERY SUMMER CHINOOK TOTAL TRAPPED



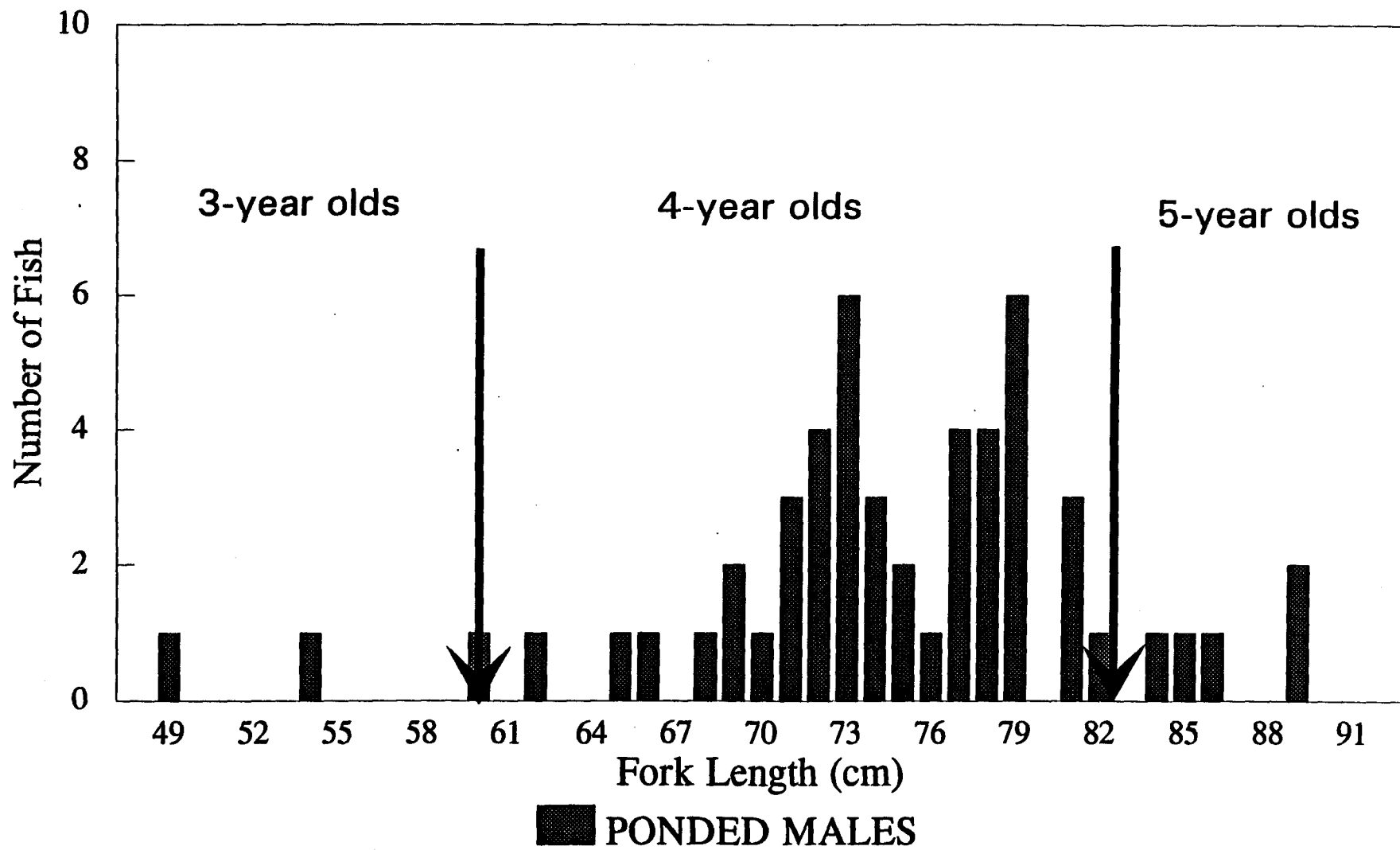
# LENGTH FREQUENCY SUMMER FEMALES-1992

## PAHSIMEROI HATCHERY SUMMER CHINOOK TOTAL TRAPPED



## LENGTH FREQUENCY PONDED MALES-1992

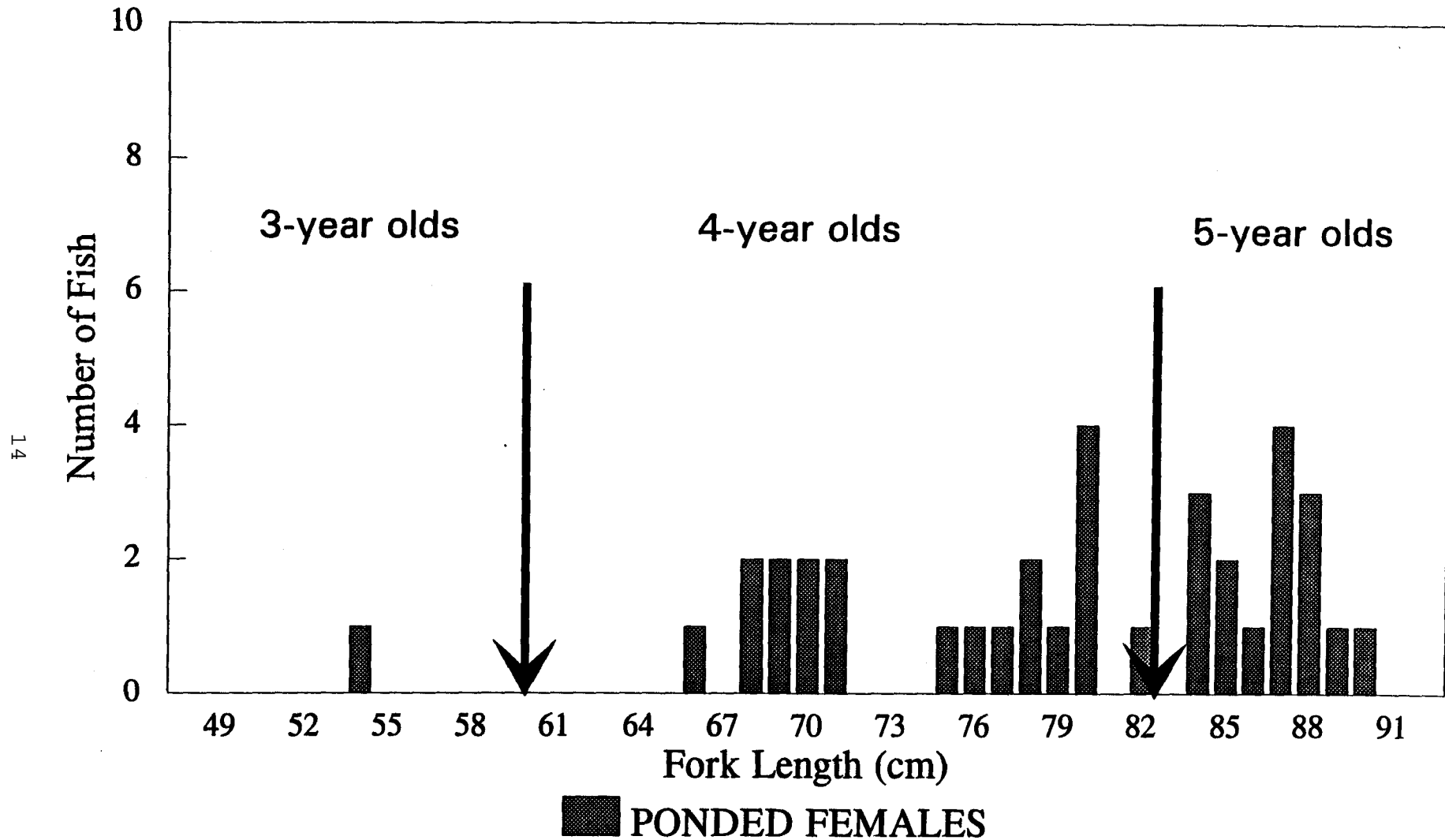
### PAHSIMEROI HATCHERY SUMMER CHINOOK





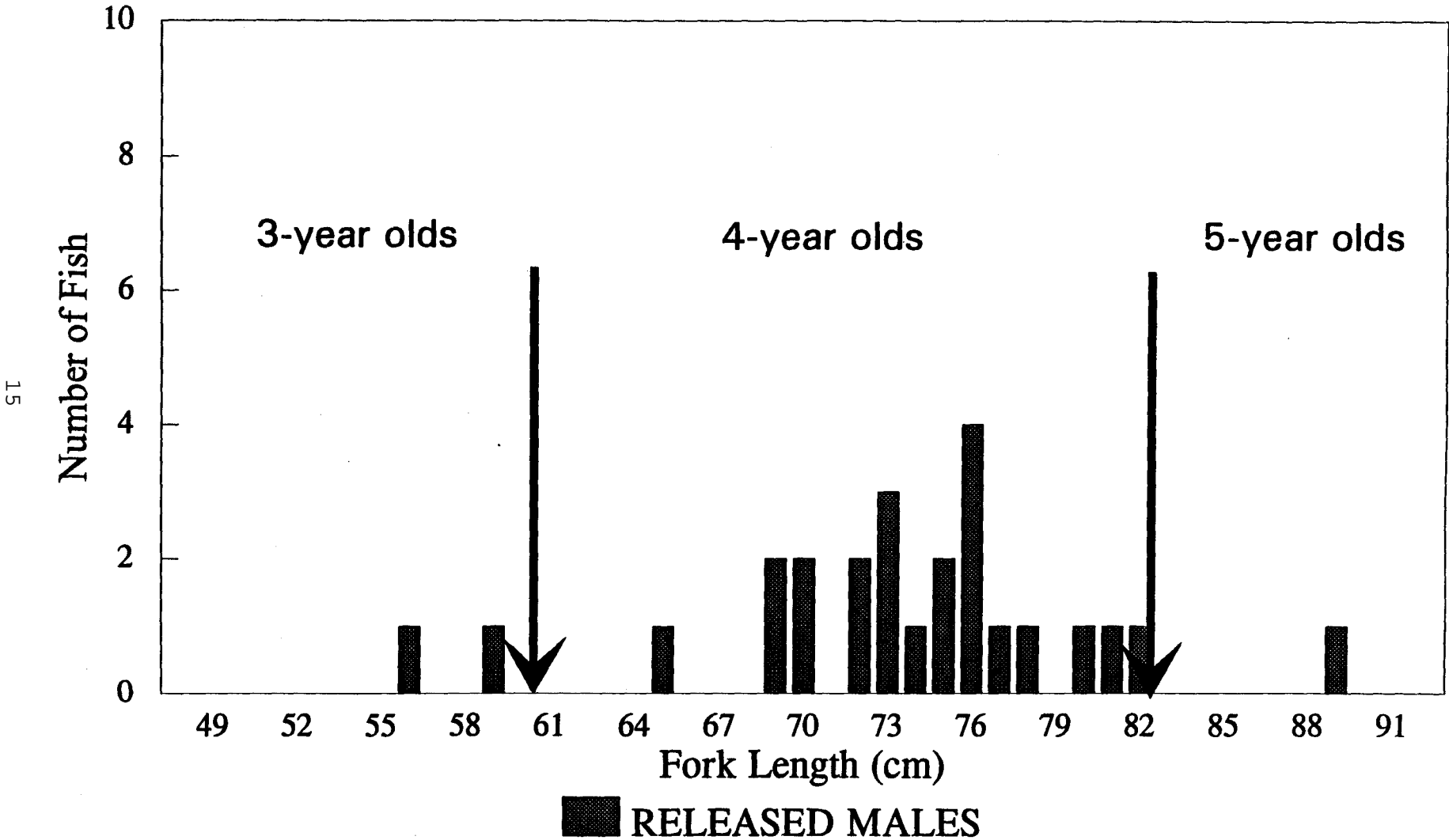
## LENGTH FREQUENCY PONDED FEMALES-1992

### PAHSIMEROI HATCHERY SUMMER CHINOOK



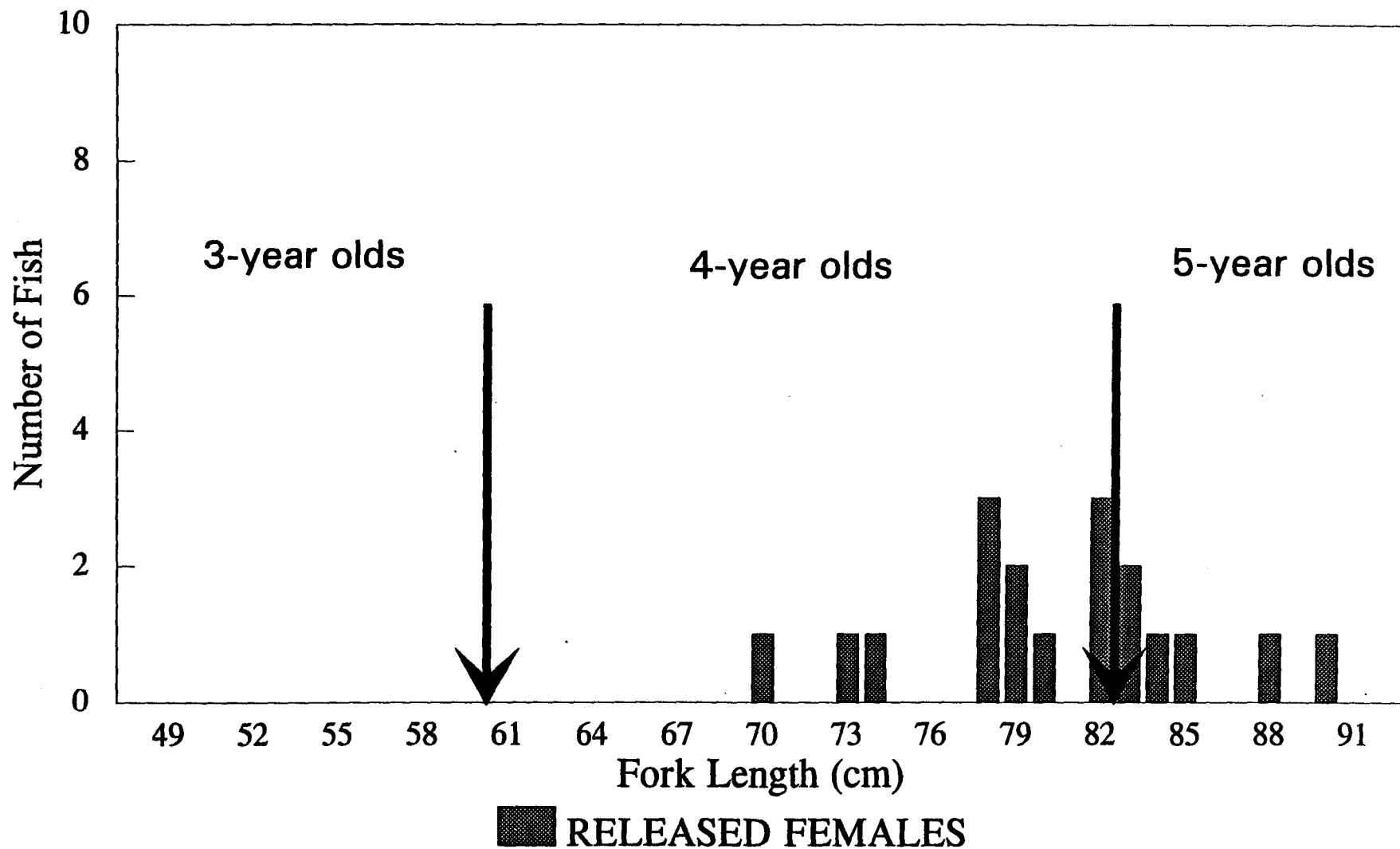
# LENGTH FREQUENCY RELEASED MALES-1992

## PAHSIMEROI HATCHERY SUMMER CHINOOK



## LENGTH FREQUENCY RELEASED FEMALES-1992

### PAHSIMEROI HATCHERY SUMMER CHINOOK



Appendix 9. Pahsimeroi Hatchery run timing for Brood Year 1992  
summer chinook.

		Date	Total	Jacks	Males	Females
June	10	10				
June	11	11				
		12	1		1	
		13	2		1	1
		14	3		2	1
		15	3		1	2
		16	3		2	1
		17	4		2	2
		18	4		2	2
		19	6		3	3
		20	7	1	4	2
	21	21	8		3	5
		22	3		2	1
		23	2		1	1
		24	1			1
		25	1			1
		26	1			1
		27	1			1
		28	1		1	
		29	2		1	1
		30	1		1	
July	1	1	2		1	1
		2	2		1	1
		3	2		1	1
		4	3		2	1
		5	3		2	1
		6	1		1	
		7	1		1	
		8	1			1
		9	1	1		
July	11	10	1			1
		11	1		1	
		12	1			1
		13	1		1	
		14	1		1	
		15	2		1	1
		16	2	1	1	
		17	2		1	1
		18	2		1	1
		19	3		2	1
July	21	20	2		1	1
		21	3		1	2
		22	2		1	1
		23	3		2	1
		24	2		1	1
		25	1		1	
		26	1		1	
		27	1	1		
		28	1			1
		29	1		1	
		30	1			1
July	31	31	2		1	1
		1	1	1		
		2	1		1	
		3	1			1
		4				
		5	1		1	

Appendix 9. Continued.

		Date	Total	Jacks	Males	Females
Aug		6	1			1
		7				
		8				
		9				
Aug	10	10				
		11				
		12				
		13				
		14				
		15				
		16				
		17				
		18				
		19				
Aug	20	20				
		21				
		22				
		23				
		24				
		25				
		26				
		27				
		28				
		29				
	30	30				
		31				
Sept	1	1				
		2				
		3				
		4				
		5				
		6	4		4	
		7				
		8	1			1
Sept	9	9	2		1	1
		10	1		1	
		11				
		12	1		1	
		13	1			1
		14	2		2	
		15	3		2	1
		16	3		2	1
		17	1		1	
		18				
	19	19	1			
		20				
		21				
		22				
		23				
		24				
TOTALS			131	5	72	54

Appendix 10. Pathology fish health report.

SUMMARY OF FISH AUTOPSY

ACCESSION NO: 94-131                      LOCATION: PA  
 SPECIES: SU                                  AUTOPSY DATE: 03/16/94  
 STRAIN: PAH                                  AGE: JUV  
 UNIT: POND 1                                  SAMPLE SIZE: 20  
 REASON FOR AUTOPSY: PRELIBER  
 INVESTIGATOR(S): MUNSON, BALL  
 REMARKS:

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
LENGTH	0.00	0.00	0.00
WEIGHT	0.00	0.00	0.00
KTL*	0.00	0.00	0.00
CTL**	0.00	0.00	0.00
HEMATOCRIT	40.70	9.61	0.24
LEUCOCRIT	0.00	0.00	0.00
SERUM PROTEIN	6.06	1.75	0.29

\*EXPRESSED AT KTL TIME 10 TO THE FIFTH POWER

\*\*CONVERTED FROM KTL; EXPRESSED AS CTL TIME 10 TO THE FOURTH POWER

VALUES AS PERCENTS OF TOTAL SAMPLE																	
EYES		GILLS		PSEUDO- BRANCHES		THYMOSEAL		MESEN. SPLEEN		IND GUT		KIDNEY		LIVER		BILE	
N	19	N	19	N	19	0	19	0	0	B	19	0	19	N	19	A	0
B1	0	F	0	S	0	1	0	1	0	R	0	1	0	S	0	B	19
B2	0	C	0	L	0	2	0	2	6	G	0	2	0	M	0	C	0
E1	0	M	0	S&L	0			3	9	NO	0			G	0	D	0
E2	0	P	0	I	0			4	4	E	0	X=0.00		U	0	E	0
H1	0	OT	0	OT	0	-	-			OT	0			T	0	F	0
H2	0			0	0	X=0.00	X=2.75									OT	0
M1	0																-
M2	0																X=0.00
OT	0																

SUMMARY OF NORMALS									
19	19	19	19	19	19	19	19	19	19
SEX	M: 0	F: 0	U: 19						

GENERAL REMARKS

FINS:    GONADS:  
 SKIN:     OTHER:

Appendix 10. Continued.

SUMMARY OF FISH AUTOPSY

ACCESSION NO: 94-132                      LOCATION: PA  
 SPECIES: SU                                  AUTOPSY DATE: 03/16/94  
 STRAIN: PAH                                  AGE: JUV  
 UNIT: POND 2                                  SAMPLE SIZE: 20  
 REASON FOR AUTOPSY: PRELIBER  
 INVESTIGATOR(S): MUNSON, BALL  
 REMARKS:

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
LENGTH	0.00	0.00	0.00
WEIGHT	0.00	0.00	0.00
KTL*	0.00	0.00	0.00
CTL**	0.00	0.00	0.00
HEMATOCRIT	41.60	5.26	0.13
LEUCOCRIT	0.00	0.00	0.00
SERUM PROTEIN	6.02	0.53	0.09

\*EXPRESSED AT KTL TIME 10 TO THE FIFTH POWER

\*\*CONVERTED FROM KTL; EXPRESSED AS CTL TIME 10 TO THE FOURTH POWER

VALUES AS PERCENTS OF TOTAL SAMPLE																			
EYES		GILLS		PSEUDO- BRANCHES		THYMUS MESEN.		SPLEEN		HIND GUT		KIDNEY		LIVER		BILE			
N	20	N	20	N	20	0	20	0	0	B	20	0	20	N	20	A	0	0	20
B1	0	F	0	S	0	1	0	1	1	R	0	1	0	S	0	B	20	1	0
B2	0	C	0	L	0	2	0	2	6	G	0	2	0	M	0	C	0	2	0
E1	0	M	0	S&L	0			3	10	NO	0			G	0	D	0	3	0
E2	0	P	0	I	0			4	3	E	0	-		U	0	E	0		
H1	0	OT	0	OT	0	-	-			OT	0	X=0.00		T	0	F	0		
H2	0			0	0	X=0.00	X=2.75									OT	0	-	
M1	0																	X=0.00	
M2	0																		
OT	0																		

SUMMARY OF NORMALS									
20	20	20	20	20	20	20	20	20	20
SEX	M: 1	F 0	U: 19						

GENERAL REMARKS

FINS:    GONADS:  
 SKIN:    OTHER:

Appendix 10. Continued.

SUMMARY OF FISH AUTOPSY

ACCESSION NO: 94-133                      LOCATION: PA  
 SPECIES: SU                                  AUTOPSY DATE: 03/16/94  
 STRAIN: PAH                                  AGE: JUV  
 UNIT: BKD RWY                              SAMPLE SIZE: 20  
 REASON FOR AUTOPSY: PRELIBER  
 INVESTIGATOR(S): MUNSON, BALL  
 REMARKS:

	MEAN	STANDARD DEVIATION	COEFFICIENT OF VARIATION
LENGTH	0.00	0.00	0.00
WEIGHT	0.00	0.00	0.00
KTL*	0.00	0.00	0.00
CTL**	0.00	0.00	0.00
HEMATOCRIT	39.05	2.85	0.07
LEUCOCRIT	0.00	0.00	0.00
SERUM PROTEIN	6.02	0.53	0.09

\*EXPRESSED AT KTL TIME 10 TO THE FIFTH POWER

\*\*CONVERTED FROM KTL; EXPRESSED AS CTL TIME 10 TO THE FOURTH POWER

VALUES AS PERCENTS OF TOTAL SAMPLE																			
EYES		GILLS		PSEUDO- BRANCHES		MESEN.				SPLEEN		HIND GUT		KIDNEY		LIVER		BILE	
N	20	N	20	N	20	0	20	0	0	B	20	0	20	N	20	A	0	0	20
B1	0	F	0	S	0	1	0	1	1	R	0	1	0	S	0	B	11	1	0
B2	0	C	0	L	0	2	0	2	5	G	0	2	0	M	0	C	9	2	0
E1	0	M	0	S&L	0			3	12	NO	0			G	0	D	0	3	0
E2	0	P	0	I	0			4	3	E	0	-		U	0	E	0		
H1	0	OT	0	OT	0	-		-		OT	0	X=0.00		T	0	F	0		
H2	0			0	0	X=0.00		X=2.95								OT	0	-	
M1	0																	X=0.00	
M2	0																		
OT	0																		
SUMMARY OF NORMALS																			
20		20		20		20		20		20		20		20		20		20	
SEX		M: 0		F: 0		U: 20													

GENERAL REMARKS

FINS:  
 SKIN:

GONADS:  
 OTHER:



Appendix 11. Pahsimeroi Hatchery summer chinook releases and returns.

Date released	Number	3-yrs	4-yrs	5-yrs	Total	Year of return	% Return
MAY 1970	300,000	89	N/A	101	N/A	71,72,73	N/A
MAY 1971	250,000	40	425	14	479	72,73,74	0.192
MAY 1972	250,000	20	138	76	234	73,74,75	0.094
MAY 1973	347,000	1	5	32	38	74,75,76	0.011
MAY 1974	330,000	8	189	436	633	75,76,77	0.192
MAY 1975	114,000	53	115	X	X	76,77,78	X
MAY 1976	121,000	7	X	32	X	77,78,79	X
MAY 1977	235,000	X	0	4	X	78,79,80	X
MAY 1978	218,000	1	29	13	43	79,80,81	0.020
MAR 1983	13,690	11	72	30	113	84,85,86	0.825
APR 1984	55,800	27	278	52	357	85,86,87	0.640
APR 1985	209,155	37	408	716	1161	86,87,88	0.555
MAR 1986	12,095	13	47	31	91	87,88,89	0.752
MAR 1987	258,600	75	180	42	297	88,89,90	0.115
MAR 1988	598,500	135	389	79	603	89,90,91	0.101
MAR 1989	1,016,300	39	139	27	205	90,91,92	0.020
MAR 1990	1,058,000	20	98	119	237	91,92,93	0.022
MAR 1991	227,500	6	37			92,93,94	
MAR 1992	605,900	13				93,94,95	
APR 1993	375,000					94,95,96	

Appendix 12. Pahsimeroi Hatchery spring chinook releases and returns.

Date released	Number	3-yrs	4-yrs	5-yrs	Total	Year of return	% Return
MAR 1983	437,332	97	1568	398	2063	84,85,86	0.472
APR 1984	1,143,029	480	6019	1463	7962	85,86,87	0.697
APR 1985	178,782	101	677	216	994	86,87,88	0.556
MAR 1986	80,948	35	185	49	269	87,88,89	0.332

Appendix 13. Summer chinook smolts released and adult returns.

Brood year	Release year	Smolts released	3-year jacks	% Release jacks	4-Year males	4-Year females	Total 4-year	% Release 4-year	5-Year males	5-Year females	Total 5-year	% Release 5-year	Total return	Total % release
1969	1970	300,000	89	0.000297			0	0.000000	15	86	101	0.000337	190	0.000633
1970	1971	250,000	40	0.000160	197	228	425	0.001700	6	8	14	0.000056	479	0.001916
1971	1972	250,000	20	0.000080	61	77	138	0.000552	25	51	76	0.000304	234	0.000936
1972	1973	347,000	3	0.000009	1	4	5	0.000014	7	25	32	0.000092	40	0.000115
1973	1974	330,000	8	0.000024	134	55	189	0.000573	243	193	436	0.001321	633	0.001918
1974	1975	114,000	53	0.000465	86	29	115	0.001009	X	X	X	0.000000	168	0.001474
1975	1976	121,000	7	0.000058	X	X	X	0.000000	18	14	32	0.000264	39	0.000322
1976	1977	235,000	X	0.000000	0	0	0	0.000000	4	0	4	0.000017	4	0.000017
1977	1978	218,000	1	0.000005	25	4	29	0.000133	9	4	13	0.000060	43	0.000197
1977	1979	NATURAL	13	N/A	17	1	18	N/A	11	7	18	N/A	49	N/A
1978	1980	NATURAL	4	N/A	9	8	17	N/A	42	56	98	N/A	119	N/A
1979	1981	NATURAL	4	N/A	2	1	3	N/A	7	5	12	N/A	19	N/A
1980	1982	NATURAL	8	N/A	11	3	14	N/A	7	4	11	N/A	33	N/A
1981	1983	13,690	11	0.000804	46	26	72	0.005259	13	17	30	0.002191	113	0.008254
1982	1984	55,803	27	0.000484	118	160	278	0.004982	25	27	52	0.000932	357	0.006398
1983	1985	209,155	37	0.000177	215	193	408	0.001951	356	360	716	0.003423	1161	0.005551
1984	1986	12,095	13	0.001075	25	22	47	0.003886	13	18	31	0.002563	91	0.007524
1985	1987	258,600	75	0.000290	105	76	181	0.000700	15	27	42	0.000162	298	0.001152
1986	1988	598,600	135	0.000226	191	198	389	0.000650	27	52	79	0.000132	603	0.001007
1987	1989	1,016,300	39	0.000038	61	78	139	0.000137	6	21	27	0.000027	205	0.000202
1988	1990	1,058,000	20	0.000019	66	32	98	0.000093	54	65	119	0.000112	237	0.000224
1989	1991	227,500	6	0.000026	12	25	37	0.000163			0	0.000000	43	0.000189
1990	1992	605,900	13	0.000021			0	0.000000			0	0.000000	13	0.000021
1991	1993	375,000												

Appendix 14. Brood year 1992 summer chinook production costs.

<u>Number</u> <u>of fish</u>	<u>Pounds</u> <u>of feed fed</u>	<u>Cost of</u> <u>feed</u>	<u>Pounds</u> <u>of fish</u>	<u>Conversion</u>	<u>Total</u> <u>budget*</u>	<u>Cost per</u> <u>thousand</u>	<u>Cost per</u> <u>pound of fish</u>
130,510	17,229	\$7,679.49	9,685	1.63	\$119,818.00	\$976.92	13.16

\* Does not include capital outlay.

Submitted by:

Bob Moore  
Fish Hatchery Superintendent II

Doug Engemann  
Fish Hatchery Superintendent I

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

  
Steven M. Huffaker, Chief  
Bureau of Fisheries  
Bill Hutchinson  
Hatcheries Manager